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Hazardous Waste: Evolution of a National Environmental Problem

The evolution of hazardous waste into a national environmental problem is a puzzling phenomenon. The public and media perceive hazardous waste to be a major environmental and public health risk. Yet, although the problem of hazardous waste and its resultant contamination has long been known, no one took it seriously until about 1978. An interesting question is, Why did the public and media ignore hazardous waste for so long, particularly during a period of unprecedented public and media interest in the environment, especially pollution, in the late 1960s and throughout the 1970s?

Before 1970, waste disposal received little national media and public attention. This would change temporarily with the U.S. Army's program to dispose of outdated nerve gas weapons in the Atlantic Ocean, which was an event too dramatic and sensational for the media and public to ignore. The nerve gas controversy demonstrated that the nation was ill prepared to manage these wastes safely and that the government knew too little about their potential ecological and public health effects. This limited state of knowledge, coupled with the lack of national laws, exacerbated public concern—especially in light of the fact that the nerve gas in question represented only one percent of the Army's total stockpile, all of which would require disposal.[1]

Given the national media focus, widespread public concern over the environment, and the propensity for Congress to act on environmental problems during this period of heightened environmental awareness, the conditions appeared ripe for establishing hazardous waste as a national problem warranting significant federal action.

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However, even with this heightened awareness, media attention and subsequent public concern regarding nerve gas and hazardous waste quickly faded. Although there was federal interest in hazardous waste, it would take multiple attempts and six years before a law was enacted and an additional four years before a regulatory program was in place.

As I argue in this article, the media and public quickly lost interest in hazardous waste and did not view it as a national problem in 1970 for three primary reasons. First, the term "hazardous waste" was not yet in the country's vernacular, which hindered the ability to construct the problem. Second, neither the public nor media could yet grasp the risks of "hazardous" waste because of a lack of widespread association between waste and potentially damaging effects. Third, the nerve gas disposal controversy appeared to be an isolated incident rather than an indicator of a national problem, primarily because the lack of tangible effects: there were no fish kills, reports of chromosome damage, plummeting property values, or widespread reports of adverse health effects. It was not until the sudden and prolonged attention of the national media and public with Love Canal, from 1978 to 1980, that hazardous waste became socially constructed and a clearer association was established between hazardous waste and damaging effects. Only then did hazardous waste appear to be a nationwide problem.

Public perception of risk is a major driver in environmental policy. As noted by J. Clarence Davies III in *Politics of Pollution* (1970), "The attitudes held by the general public form the ultimate parameters of government action."[2] U.S. Environmental Protection Agency studies in 1987 and 1990 confirmed that public risk perception was shaping national environmental management priorities rather than being shaped by the perceptions of environmental experts.[3] The public's perception of risk is heavily influenced by mass media through identification, framing, visualization, and dramatization of environmental problems.[4] Whether the media becomes and remains interested in a problem also depends on the construct of the problem and the conditions under which an environmental problem is discovered. Collectively, public risk perception, media attention, problem construct, and discovery conditions not only determine whether a problem is ripe for a policy response, but they also strongly influence its design, which can have serious implications for future policymaking.

The evolution of hazardous waste into a national problem demonstrates the importance of sustained public and media attention and their perception of risk. And, as I argue here, the construct of the problem and the conditions in which it became part of the national agenda so influenced the media and public that it ultimately undermined a rational response to hazardous waste management.

The Perception of Waste Before 1965

Before 1965, exactly how much was known about the health and environmental impact of industrial waste has been hotly debated.[5] Colten and Skinner argue that industry and government had considerable knowledge of the adverse effects of industrial waste throughout the twentieth century.[6] Although this may be accurate, my focus is not on the state of knowledge per se, but on the media and public's attention to and perception of hazardous waste, which I argue is crucial to meaningful government action. And, before 1970, there had been little media and public interest beyond isolated localized cases.

A plausible explanation for this lack of interest was likely the collective categorization of wastes into municipal and industrial categories rather than into the categories of hazardous and nonhazardous. The term "hazardous waste" was not used before 1970, and thus was not yet conceptually separable from municipal or industrial waste.[7] In this case, semantics is important because to the general public the terms "municipal, industrial, and trade waste," "rubbish," "refuse," and "garbage" were so broad and vague that few made an immediate association with health and environmental risks. In contrast, the term "hazardous" clearly connotes some level of concern. To be sure, it is not only semantics; air and water pollution were well-established constructs, whereas the construct of "hazardous" waste was amorphous. Unlike air and water pollution, hazardous waste lacked an immediate visual reference. Oil-soaked sea otters and spewing smokestacks provide immediate associations, whereas contaminated subsoil or groundwater, typical results of hazardous waste mismanagement, are abstract. (Since then, it has become the culturally symbolic metal drum.) A contributing factor to the construct argument is that before federal and state pollution control laws were enacted in the 1970s, the government had limited authority to inspect industry's on-site activities, where most waste was managed. Industry was not universally obligated to report waste management activities, on-site spills or releases, or on-site contamination, and it

reported only under highly unusual circumstances. Consequently, as we discovered later, contamination of groundwater by industrial waste was grossly underreported. Had the extent of contamination been known earlier, it is likely that the media would have been more interested and thus would have provided visual associations sufficient to help develop a construct of hazardous waste.

The Solid Waste Disposal Act of 1965

Before 1965, there was no national law that addressed solid waste because historically it was viewed as a local issue. However, as the nationalization of pollution control was beginning to take shape in the 1960s and all sources of pollution were ripe for examination, garbage was not immune. Initially, the federal government's interest in solid waste focused on its potential to contribute to air and water pollution, as noted by the President's Science Advisory Committee in 1965.

> The problem of solid wastes has not been so immediately pressing as those of gaseous and liquid wastes. In the long run, however, solid waste problems are likely to be more critical. The subject is broader than the simple disposing of solids. Measures for handling solid wastes have a direct bearing on the character of both air and water pollution, which must be taken into account in solid waste management.[8]

Increasingly, it was solid waste's contribution to air pollution, primarily because of the widespread practice of landfilling and open burning (approximately 80 percent of the nation's communities practiced open burning as a waste-reduction method),[9] combined with a constant per capita increase in waste generation, that prompted federal concern.[10] As noted by the National Academy of Sciences, "The public's general lack of interest in the disposal of waste materials is a root cause for its increasing production."[11] Because Congress's legislative focus in the early 1960s was on air pollution, federal control over solid waste could therefore be justified.[12] Consequently, in 1965, the Solid Waste Disposal Act was offered as Title II to the Motor Vehicle Air Pollution Control Act, which amended the Clean Air Act of 1963. Senator Edmund Muskie (D-Me.) introduced the bill in January 1965. Nearly half of Muskie's statement accompanying the introduction of the air legislation was devoted to solid waste.[13]

The Solid Waste Disposal Act of 1965, enacted on 20 October 1965, contained six general findings relating to solid waste.[14] (The law defined solid waste as "garbage, refuse, and other discarded solid materials, including solid waste materials resulting from industrial, commercial, and agricultural operations.")[15] First, because of technological progress, the amount of per capita solid waste generation had increased. Second, because of increased affluence and population, production (industrial) wastes and construction and demolition wastes had increased. Third, the increasing urbanization of America had led to financial strains in addressing solid waste management. Fourth, inefficient and improper disposal methods had resulted in scenic blights, created serious hazards to the public health, increased rodent and insect vectors, adversely affected land values, created public nuisances, and otherwise interfered with community life and development. Fifth, the inability to recover and reuse waste material had depleted natural resources. Sixth, the solid waste issue remained primarily a state and local function, but the problem had become national in scope, thereby necessitating federal action.

The Solid Waste Disposal Act had two primary purposes: to initiate and accelerate a national research and development program for new and improved methods for solid waste management and to study methods to increase the recovery of waste materials, and to provide technical and financial assistance to state, local, and interstate agencies in planning, developing, and conducting solid waste disposal programs.[16] It did not, however, attempt to regulate the generation or disposal of waste.

Passage of the Solid Waste Disposal Act established the federal government's role in solid waste management, which is significant given that it had consistently been considered a local responsibility. However, because a primary concern with solid waste was its contribution to air pollution, except for brief mention during the act's debates, "hazardous" waste was not addressed because there was little indication that it was a problem.

Growing Environmental Awareness, 1965–1970

Concurrent to the growing debate over solid waste was public concern over the environment, which had increased dramatically during the late 1960s. As reported by public opinion researcher Hazel Erskine, "A miracle of public opinion has been the unprecedented

speed and urgency with which ecological issues have burst into American consciousness."[17] She noted that concern about the environment sprang from nowhere to major proportions in a few short years. The zenith in public awareness of environmental problems occurred on 22 April 1970, the nation's first Earth Day, which included some 20 million participants.

Between 1965 and 1970, the media's reporting of environmental stories steadily increased.[18] In 1970, a dozen television specials and numerous newspaper and magazine articles picked up the theme of the ecological crisis.[19] Not only was the frequency of environmental stories increasing, but they were being covered in greater depth. Clearly 1970 was a year in which the environment became a hot topic for the mass media, which paralleled the increasing concern recorded by major public opinion polls. In 1965, when the first environmentally oriented public polls appeared, only about one in ten considered the problem very serious; but by 1970, the majority of people polled expressed concern over the environment, especially air and water pollution. In Erskine's compilation of public polls from 1965 to 1970, no questions or responses mentioned hazardous waste.[20]

Given the rise and intensity of media and public attention, it is no wonder there was a profusion of federal action in 1970. President Nixon's State of the Union Message focused on the environment; the U.S. Environmental Protection Agency, Council on Environmental Quality, and the National Oceanic and Atmospheric Administration were created; and the National Environmental Policy Act and Clean Air Act were enacted.[21]

Operation CHASE, 1970

In August 1970, just four months after the nation's first Earth Day celebration, the U.S. Army dumped more than 135,000 pounds of outdated, lethal nerve gas in the Atlantic Ocean.[22] The nerve gas was transported from storage depots in Kentucky and Alabama by two trains on routes covering approximately 1,400 miles of track through numerous communities across seven states, ending at the Sunny Point Military Terminal near Wilmington, North Carolina.[23] The nerve gas was loaded onto a Liberty Ship, the "LeBaron Russell Briggs," where it was scuttled and sunk in three miles of water off the U.S. coast between Florida and the Bahamas.[24] This was part of Operation CHASE, a military acronym for "Cut Holes And Sink

'Em."[25] Although this was not the Army's first nerve gas ocean-disposal action, it was the first to be reported publicly.[26]

Operation CHASE was a controversy tailor-made for the American mass media of 1970: these weapons were intentionally designed to poison humans, and the actors included colorful local politicians, frightened housewives, feckless bureaucrats, and the Vietnam-era military assuring the public that it was not at risk.[27] In 1970, fifty-eight separate segments pertaining to the nerve gas event were aired on the evening news on the three national networks (ABC, CBS, and NBC).[28] The national print media also maintained heavy coverage. For example, in the *New York Times,* forty-two issues contained at least one article on Operation CHASE. In August, similar to the national networks, the *New York Times* carried nerve gas–related articles on twenty-one days. Congress could not stand by idly watching the outpouring of national public concern and media attention. It held numerous hearings on nerve gas to identify disposal alternatives. One of the more interesting alternatives considered was disposal by underground nuclear detonation.[29]

As John Kingdon argues, a focusing event can bring a problem to national attention, but additional indicators are necessary to establish the problem as one of lasting, national concern; otherwise, the problem withers.[30] Although the nerve gas event received national attention, there had been little information before this event to suggest that "hazardous" waste was a national problem. The quick fall-off of media attention reinforced this view. To be sure, given that Operation CHASE was a guarded military operation, specific details indicating that it was a problem and media access were extremely limited. Consequently, to the public, it was an isolated occurrence and its primary impact was on the oceans, not their backyards. Thus, hazardous waste quickly became a nonissue. An additional contributing factor is the limited capacity of public attention to national problems. And 1970 and 1971 were fecund years for other controversial national events that competed with hazardous waste for the public's attention, which included the American invasion of Cambodia, the Kent State University shootings, the trial of Lieutenant William Calley, President Nixon's wage-price controls, the national ban on cigarette television and radio advertising, and the enactment of the Clean Air Act. These events and the lack of other problem indicators support the thesis that although hazardous waste was a problem, the indicators necessary to characterize it as a problem were insufficient and, more likely, were not correctly interpreted.

The Federal Response, 1970

In 1970, the Solid Waste Disposal Act was due to be reauthorized. The CHASE nerve gas event painfully illustrated that the nation was not equipped to dispose of dangerous wastes properly, which prompted Congress to include section 212, the National Disposal Sites Study, in the proposed Senate reauthorization bill, known as the Resource Recovery Act.[31] Section 212 mandated the preparation of a report and plan for the creation of a system of "national disposal sites" for the storage and disposal of hazardous wastes, "including radioactive, toxic chemical, biological, and other wastes which may endanger public health or welfare."

After the bill passed both chambers unanimously, President Nixon signed the Resource Recovery Act on 26 October 1970, reauthorizing and amending the Solid Waste Disposal Act.[32] The act's findings and purpose did not deviate significantly from the 1965 act and remained focused on promoting resource recovery and assisting states, financially and technically, with developing their solid waste programs. However, for the first time, Congress raised the issue of hazardous waste by including the section 212 requirement. Although nerve gas was primarily a federal problem, the fact that Congress was willing to consider the quasi-nationalization of a historically local responsibility indicated the gravity of the situation. The act embodied the realization that little was known regarding the extent of the hazardous waste problem. Clearly there was concern that the problem could only worsen given the large stockpile of outdated nerve gas that needed to be disposed of and the likelihood that other hazardous wastes needed attention.

An additional outcome of the Resource Recovery Act of 1970 is that the term "hazardous waste" appeared at the national level. Before then, it had been uncommon to distinguish between "hazardous" (or toxic wastes) and "nonhazardous" waste.[33] Only after the CHASE nerve gas event and the passage of the Resource Recovery Act did the term enter the legal vernacular, thereby allowing the construct to take shape. However, it did not gain widespread use until Love Canal. Even though the adjective "hazardous" is clearly inflammatory, it made little impact until the public could connect hazardous waste with obvious and familiar health, environmental, and economic damage.

The nerve gas event also initiated concern over the use of oceans for waste disposal. In a message to Congress on 15 April 1970, President Nixon directed the Council on Environmental Quality to conduct a comprehensive study on ocean dumping, which was released just six months later, in October.[34] The report stated that although ocean dumping was not yet a nationwide problem, decisions by industry and municipalities over the next few years could lead to increased dumping. Consequently, "there is a critical need for a national policy on ocean dumping."[35] The report recommended that ocean dumping be controlled under a permit program and the dumping of chemical warfare agents be banned. Parallel to the release of the report, the House Committee on Merchant Marine and Fisheries held hearings in August 1970, which eventually resulted in the Marine Protection, Research, and Sanctuaries Act of 1972 (P.L. 92–532).[36] Title I of the act, which contains the permit and enforcement provisions related to ocean disposal, is commonly referred to as the Ocean Dumping Act. It prohibits the unpermitted dumping or transportation for dumping of radiological, chemical, or biological warfare agents, chemicals, and industrial waste. This closed off a significant disposal option for hazardous waste.

Paradoxically, the enactment of the Resource Recovery Act and the debates leading up to the Ocean Dumping Act should have established hazardous waste as a national concern. Hazardous waste was essentially deemed too toxic for ocean disposal and proper, land-based disposal sites were practically nonexistent. However, this was not the case. A plausible explanation for the decline in public interest is Anthony Downs's theory of the "issue attention cycle," which occurs when the public becomes bored with an issue and media attention declines.[37] Similarly, Riley Dunlap posits that once the government intervenes in an environmental problem, the public is led to believe that the problem is being taken care of, thereby allowing it to focus its attention on other issues.[38]

The Hazardous Waste Issue, 1971–1975

Although media and public interest faded, the federal government remained interested in hazardous waste. Following the enactment of the Resource Recovery Act of 1970, the next major federal action was President Nixon's February 1971 proposed legislation specifically addressing hazardous waste disposal, the Toxic Waste Disposal

Control Act.[39] As described in the transmittal letter accompanying the proposed legislation, "the Toxic Waste Disposal Control Act would provide for a nationwide program to regulate land and underground disposal of wastes toxic to human health." The report described the need for legislation because "as controls over disposal of toxic substances directly into surface waters are strengthened, the use of land or underground strata for such disposal can be expected to increase significantly, particularly with the enactment of needed controls over ocean disposal, which the President has proposed."[40]

However, Epstein et al. argue that the primary intent of Nixon's hazardous waste proposal was the administration's desire to limit federal involvement and keep solid waste management as a state and local responsibility.[41] Nixon supported separate hazardous waste legislation as a means to prevent the EPA's involvement in solid waste, more specifically, source-reduction activities of the resource conservation components of the Solid Waste Disposal Act, which were viewed as an excessive intrusion into industry's activities. (This was also a period in which new environmental initiatives were highly scrutinized because of the energy crisis, an economic recession, and the failure of existing environmental programs to live up to their lofty expectations.) By implementing a hazardous waste regulatory program, the EPA's waste program employees would be "fully occupied and then some."[42] Thus, the administration's proposed bill was designed to be a substitute for the federal solid waste program.[43] The bill received little attention and had no congressional sponsor and thus no action occurred.

In early 1973, the Nixon administration again proposed hazardous waste legislation with its Waste Disposal Act of 1973. This proposal also called for a reduced federal role in solid waste management but an increased role in hazardous waste—a role described as "largely that of a policeman for the disposal of toxic industrial wastes."[44] Again, no congressional action was taken.

In February 1973, hearings were held on extending the Solid Waste Disposal Act of 1965 (as amended by the Resource Recovery Act) before the House Subcommittee on Public Health and Environment, Committee on Interstate and Foreign Commerce. David Dominick, the EPA's Assistant Administrator for Categorical Programs, testifying before the subcommittee, outlined the EPA's progress on the implementation of the Solid Waste Disposal Act. Dominick stated that because the mandated studies under the act "concerning municipal solid waste problems are complete, we expect to devote

increasing attention to the challenging problems of hazardous waste management." This signaled the EPA's desire to solidify the separation of hazardous and municipal/solid waste management. He said that the technology for solving the solid waste problem was already available; therefore, the EPA intended to concentrate on formulating guidelines and standards for hazardous waste. Dominick warned that the hazardous waste problem was growing because federal pollution-control regulations had shifted disposal from air and water to land.[45] He further went on to describe the difficulties (i.e., the lack of qualified experts, insufficient planning, and ineffectual contracts) the EPA had in preparing the National Disposal Sites Study for hazardous waste mandated by section 212 of the Resource Recovery Act, which was supposed to have been submitted to Congress by 26 October 1972, but had not yet been submitted.[46] House Health Subcommittee Chairman Paul Rogers (D-Fla.) questioned Dominick on the Nixon administration's strategy of submitting draft legislation on a problem it had yet to define and explain to Congress (a reference to the administration's proposed hazardous waste legislation, the Waste Disposal Act of 1973).[47]

This perceived lack of concern by the EPA over solid waste intensified congressional frustration, which was exacerbated by the Nixon administration's proposal to reduce the federal role in solid waste management. Although Congress had increased the EPA's solid waste budget, the agency's solid waste personnel and activities had decreased in spite of EPA reports that the generation of waste was increasing and little progress had been made in protecting the environment from its disposal.[48]

In June 1973, the EPA submitted its section 212 National Disposal Sites Study to Congress in an attempt to establish hazardous waste as a national problem. Although section 212 requested that the EPA examine only the creation of a system of "national" disposal sites, the EPA expanded the report to cover the entire hazardous waste issue, not just a national disposal system. The report represented the first national, comprehensive analysis of hazardous waste. It concluded that hazardous waste was a growing problem that presented a significant impact to public health, and there were no legal or economic incentives to manage hazardous waste in the most environmentally protective approach. Using a general definition of hazardous waste, which included toxic chemical wastes, toxic metals, synthetic organics, flammables, pathological hospital wastes, and chemical warfare wastes, the EPA's report noted that approximately

10 million tons of hazardous waste were generated annually, 90 percent in liquid or semiliquid form.[49] The report further noted that the amount of hazardous waste generated was increasing five to ten percent annually because of greater consumption and production rates and strengthened controls on air and water pollution. A highlight of the report was the lack of economic incentive to manage waste "properly" because of the high costs of engineered hazardous waste disposal facilities. Ocean dumping and simple land disposal cost $3 per ton, whereas environmentally adequate management could cost as much as $60 per ton.

Crucial to the report's findings was the analysis of existing legal control mechanisms to adequately address hazardous waste management. Based on the EPA's review, numerous existing federal laws "exert a significant but peripheral impact" on hazardous waste management.[50] In fact, some laws directly increased the hazardous waste problem by closing off traditional disposal routes such as the ocean, air, and surface water. In addition, the revised laws addressing consumer hazardous substances and pesticides had increased the collection of cancelled and banned toxic substances. State laws were in place to address radioactive waste, but not chemical hazardous waste. The report concluded that land-based hazardous waste treatment, storage, and disposal were essentially unregulated at the federal and state level.[51]

The report also summarized the various acute and chronic risks from general exposure to hazardous substances, but it did not attempt to make a direct causal link. The report stated that "evidence points to the fact that hazardous wastes are detrimental to public health and the environment. The real issue, therefore, is to document the fact that present management practices for testing, storing, or disposing of hazardous waste do not provide the necessary reassurances that man or the environment are adequately being protected."[52] The EPA's report also documented various incidences of health and environmental problems resulting from improper hazardous waste disposal. The cases included groundwater and surface water contamination, fish kills, poisonings, and a case where a shrimp trawler netted drums of hazardous waste previously disposed of in the ocean. Nevertheless, the National Disposal Sites report failed to elicit significant media or public attention.

In March 1974, Paul Rogers, chairman of the House Health Subcommittee, opened hearings on the implementation of the Solid Waste Disposal Act. Again, Representative Rogers expressed anger

over the Nixon administration's attitude toward solid waste, which continued to dominate the waste issue. Specifically, the Nixon administration cut the budgeted positions for solid waste to their lowest level since 1967, the second year of the federal solid waste program.[53] It also cut federal funding for solid waste programs by 82 percent, supported the extensions of New Jersey's and New York's ocean-dumping permits, and failed in its attempts to close open dumps.[54] Concurrent with the House hearings, the Senate also held hearings. Both chambers focused on the administration's proposed cutbacks in solid waste program funding more than the need for new legislation, which likely would have addressed hazardous waste.[55] Interestingly, the Senate, the House, and the administration all supported hazardous waste legislation. Hazardous waste, however, remained a sub-issue to solid waste, primarily because of the political battle over solid waste funding and implementation. Because the branches could not agree as to how solid waste should be addressed, Congress recessed without acting on hazardous waste.[56]

The Resource Conservation and Recovery Act of 1976

Since its enactment in 1965, the Solid Waste Disposal Act had been a nonregulatory law, primarily designed to conduct research, provide technical and financial support, and disseminate technical information. In 1975, Senator Jennings Randolph (D-W.V.) introduced a bill to change this passive approach. He proposed in bill S. 2150 "to amend the Solid Waste Disposal Act to authorize State program and implementation grants, to provide incentives for the recovery of resources from solid wastes, *to control the disposal of hazardous wastes*, and for other purposes [emphasis added]."[57] In the Senate Public Works Committee, the bill was gutted and rewritten only to extend funding for the Solid Waste Disposal Act for one year.

In December 1975, the EPA held a series of meetings to solicit public comment "to assist the agency in determining the types and character of any advice and guidance which should be developed for the environmentally safe management of hazardous wastes."[58] The EPA realized that legislation was imminent and took the unusual approach of soliciting comments on a problem without explicit statutory authority to resolve the problem. During the public meetings, the struggling hazardous waste industry was well represented and pushed for federal intervention for obvious economic self-interest.[59]

A few large corporations voiced tepid support for a federal program probably because they realized control over hazardous waste was inevitable and it was better to have one uniform federal program instead of fifty different state programs. Environmental groups were noticeably absent from the public meetings other than a few local environmental groups or chapters. Only one national environmental organization, Environmental Action, participated.

In early 1976, Senator Randolph again introduced solid waste legislation (S. 3622). This bill was essentially the same one he had proposed the year before (S. 2150) and contained the same provision to regulate hazardous waste.[60] In Randolph's proposed bill, however, the most controversial aspect was not hazardous waste, but a proposal to ban throwaway beverage containers, the forerunner to a national deposit scheme. Consequently, more than half the Senate's time devoted to this bill centered on the beverage container proposal.[61]

Also in early 1976, Representative Fred Rooney (D-Pa.) introduced H.R. 14496, "a bill to provide technical and financial assistance for the development of management plans and facilities for the recovery of energy and other resources from discarded materials, and *to regulate the management of hazardous waste* [emphasis added]."[62] Language in the House report accompanying the bill expressed Congress's concern with hazardous waste:

> The overriding concern of the Committee, however, is the effect on the population and the environment of the disposal of discarded hazardous wastes–those that by virtue of their composition or longevity are harmful, toxic or lethal. Unless neutralized or otherwise properly managed in their disposal, hazardous wastes present a clear danger to the health and safety of the population and to the quality of the environment. In addition, much of the hazardous waste disposed of in an environmentally unsound manner is in interstate commerce without adequate monitoring of its movement or disposition.[63]
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> Without a regulatory framework, such hazardous waste will continue to be disposed of in ponds or lagoons or on the ground in a manner that results in substantial and sometimes irreversible pollution of the environment.[64]

Similar to the Senate proposal, there was little debate over the hazardous waste component in the House. Instead, the debate centered on the appropriate role of the federal government in financially supporting solid waste resource-recovery facilities. The House Commerce Committee approved the bill on 9 September 1976.[65] The House Rules Committee scheduled RCRA for floor action on 27 September, just four days before the end of the session.[66] There was little time remaining in the session, and, because the House had not yet voted on the combined bill, there was no conference committee to hammer out the details between the approved Senate version and the yet-to-be-voted-on House version. Staff from the House Commerce and Senate Public Works Committees met over the weekend before adjournment and produced a version combining the previously approved Senate bill and the reported House bill.[67] The House approved the bill by a vote of 369 to 8 on 27 September. Because the substitute bill was delivered just minutes before its consideration on the floor, no member of the House other than those who crafted the bill had the opportunity to read it before voting.[68] The Senate approved the bill on 30 September, the last day of the session.

President Ford signed the Resource Conservation and Recovery Act on 21 October 1976, which the national media ignored. Although there was one sentence in the *Washington Post* concerning the passage of RCRA by Congress on 1 October 1976, there was no mention pertaining to President Ford's signing of the bill.[69] Similarly, there was no mention of the law's passage in the *Los Angeles Times*, the *New York Times*, *Newsweek*, or *Time*. Moreover, there was no mention on any of the three major networks' evening news. Environmental groups and industry similarly were silent; their attention had focused on the Toxic Substances Control Act (TSCA), which was enacted just ten days before RCRA. One of the major environmental organizations involved in pollution control (and later, hazardous waste), the Environmental Defense Fund, did not mention RCRA in its newsletter but did discuss the enactment of the Toxic Substances Control Act.[70] The two other major environmental groups involved in pollution control during that period, the Sierra Club and the Natural Resources Defense Council, also ignored the signing of RCRA in their newsletters.[71]

Although RCRA contained several objectives, Congress's stated "overriding concern" in enacting RCRA was to establish the statutory framework for a national system that would ensure the proper

management of hazardous waste. Curiously, however, the hazardous waste component received minimal attention and little debate within and outside Congress. The lack of debate was due in part to RCRA's rather simplistic and vague legislative language concerning hazardous waste, which drew little controversy. Instead, most of the debate was on the bottle-bill portion, which proved to be very controversial. According to Blake Early, then lobbyist for Environmental Action, "We pursued an intentional 'stealth' strategy of focusing public attention on the need to adopt the 'bottle bill' . . . as a means of diverting industry attention away from the hazardous waste provisions."[72] An additional crucial element was the absence of a protracted conference between the Senate and the House as floor action on RCRA was scheduled in the House on 27 September and by the Senate on 30 September, the day before adjournment. Finally, Congress's parallel consideration of the Toxic Substances Control Act (TSCA) was the environmental bill perceived to be far more important to industry and environmental groups. Blake Early observed that TSCA was the focus of industry's attention, allowing RCRA to slip through with little controversy.[73] There was also some belief that TSCA's unique front-end approach could minimize the need for residuals management as envisioned by RCRA.[74] One of the results of this focus and perspective was the neglect of RCRA, which was concurrently taking shape in Congress.

The Implementation of RCRA, 1976 to 1978

Following RCRA's enactment in 1976, the EPA was required to finalize regulations to create a new federal hazardous waste regulatory program by 23 April 1978. To achieve this, the EPA needed a comprehensive understanding of the hazardous waste problem: it needed to formulate the necessary goals to achieve the statutory charges, and it needed to create the regulations to achieve the goals. These regulations had to be written and proposed, public hearings had to be held, public comments responded to, and the regulations finalized.

The EPA failed to propose regulations, let alone finalize them, by the 23 April statutory deadline. This missed deadline, however, stems from Congress's and the EPA's underestimation of the level of effort; inadequate time, resources, and staff expertise; vague statutory language concerning the goals, direction, and scope of the pro-

gram; and the EPA's massive efforts to concurrently implement other major statutes, including the Clean Water, Clean Air, and Safe Drinking Water Acts and TSCA. Nevertheless, criticism of the EPA's apparent inadequate efforts abounded. In June 1978, the General Accounting Office criticized the EPA's effort in a report, which was followed by criticism from various congressional leaders in July.[75] Environmental and industry groups became more involved by filing notices of intent to sue because the EPA failed to meet RCRA's statutory deadlines.[76] Interestingly, surrounded by this backdrop of mounting criticism by a multitude of fronts, during the first half of 1978 the public and media remained uninterested in hazardous waste. This, however, was to change in August with the discovery of Love Canal.[77]

Love Canal's Impact on the Perception of Hazardous Waste, 1978 to 1980

On 2 August 1978, the *New York Times* published a major story about Love Canal. The commissioner of the New York Department of Health announced a "health emergency" at Love Canal involving a "great and imminent peril" to the health of the general public and recommended that pregnant women and children under two move out as soon as possible.[78] The announcement of "great and imminent peril" became national news. That evening, CBS and ABC reported the story. The story appeared in the *New York Times,* often on the front page, every day until 10 August, when the paper stopped publication due to a strike.[79] *Time* and *Newsweek* also ran major articles on Love Canal in August.[80] In September, the New York State Health Commissioner, Robert Whalen, issued a report describing the chronology of state actions and findings leading up to the emergency. The title of this report, printed in red letters, was "Love Canal: Public Health Time Bomb."[81] The report described the situation as "profound and devastating, [a] modern day disaster" of "great and imminent peril."[82]

Adding to the furor of Love Canal in 1978 was the revelation that although Congress had previously passed a law (RCRA) to address hazardous waste, federal regulations had not yet been promulgated to implement the law, indicating a lack of governmental concern. Although there were legitimate reasons for the delay, the national media and frightened public were not interested. As noted

by Steffen W. Phlen, former EPA Deputy Assistant Administrator for Solid Waste (the office responsible for implementing the hazardous waste requirements of RCRA):

> The hazardous waste issue was nearly invisible. EPA had documented hundreds of hazardous waste damage incidents, and these had persuaded Congress that a Federal regulatory program was needed. But the request for supplemental appropriations to support RCRA had been turned down by the Office of Management and Budget (OMB), and public interest was limited, to say the least. Then, in August 1978, Love Canal broke, to be followed by PCBs in North Carolina, Silresim in Massachusetts, the Valley of the Drums, Jackson Township, Chemical Control, and countless other incidents of health and environmental damage. Public perceptions changed dramatically. The hazardous waste issue moved rapidly to the top of the environmental priority list.[83]

A result of the intense media coverage was that the public began to view hazardous waste as a serious national problem, a problem that could reside in the backyards of an unsuspecting public. As noted by Alan Mazur, "Love Canal had finally saturated the central news organs and flowed from there to local outlets across the country."[84] By the end of the week of heavy national coverage, President Carter had declared the area an emergency, but provided no funds, and Governor Hugh Carey of New York made emergency funds available for evacuation and purchase of homes.[85] It was discovered that Love Canal was not an aberration. Other former hazardous waste disposal sites even larger than Love Canal, such as the Kin-Buc landfill, Chemical Control Corporation, and Kentucky's Valley of the Drums, were soon "discovered" in and near backyards. In addition, increased government inspection authority and industry reporting requirements, which forced industry to be more open about on-site environmental conditions, indicated that soil and groundwater contamination from hazardous waste was far more widespread than expected. This contamination was not contained by property boundaries and could seep into the backyards of unsuspecting homeowners.

After the immediate news blitz in the summer of 1978, coverage on hazardous waste dropped considerably but still remained higher than before 1978, fueled by continuing coverage of Love Canal.

Those Love Canal homeowners whose homes were not bought during the initial phase of government action were essentially trapped and saw their homes become all but worthless. The government and media declared parts of the area too dangerous to inhabit, but financial support was not provided for the remaining homeowners who obviously could not sell their homes. Furthermore, neither the EPA nor New York State would conclusively declare that the remaining residents were unaffected by the canal.

While the federal government sounded the alarm, it subsequently appeared uncaring and inept, which combined with economically trapped homeowners, children as innocent victims, and big business as the enemy, gave rise to a sympathetic media and a fearful public. Such conditions were highly conducive to the development of a social movement. The missing piece was a highly effective spokesperson who could effectively communicate the issue to the media and public. The person who emerged was Lois Gibbs, president of the Love Canal Homeowners Association. Alan Mazur characterized Lois Gibbs as articulate, pretty, and confrontational, and a good television subject who continually created fresh "news" by confronting government officials, holding rallies, and releasing results from studies.[86]

The homeowners continued political and media pressure after 1978, but to little avail until 1980. On 17 May 1980, the front page of the *New York Times* reported the results of a study that found eleven of thirty-six recently tested residents of Love Canal might have suffered chromosome damage from buried toxic chemicals. (Although the chromosome report's validity was subsequently discredited, the report's initial effect was overwhelming.) The fear of chromosome damage unleashed another barrage of national news coverage, surpassing even the initial coverage of August 1978.[87] On 19 May, the Lois Gibbs and the Love Canal Homeowners Association took two EPA officials "hostage" and, in front of the media, called the White House demanding action.[88] This coverage culminated two days later, on 21 May 1980, when President Carter declared a state of emergency.[89] As noted by Landy et al.: "The subsequent shockwave of publicity was enormous. From the mid-May to the mid-June 1980, Love Canal was virtually a daily feature of network newscasts. In addition, it was featured on the news programs 'Today,' 'The MacNeil-Lehrer Report,' 'Sixty Minutes,' and 'Good Morning America.' Phil Donahue devoted a full hour of his talk show to the story, busing forty area residents to Chicago for the taping."[90]

This sustained media and public outcry led to President Carter signing the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) into law on 31 December 1980. CERCLA, more commonly known as Superfund, was a sweeping law intended to augment RCRA by focusing on abandoned and previously disposed hazardous waste. In no small part, Superfund was specifically designed to prevent future Love Canals. The enactment of Superfund was a significant achievement because no major environmental law had been conceived and passed within a single legislative session—not to mention that it was to be funded by new taxes during a poor economy and enacted under a lame-duck president.[91]

The Implementation of RCRA, 1980

In 1980, the EPA finally published the first phase of the hazardous waste regulations, nearly fours years after the enactment of RCRA. Even this milestone was not without drama. On 30 April 1980, EPA's administrator, Douglas Costle, was to hold a press conference at the infamous Chemical Control Corporation dump in Elizabeth, New Jersey, to announce the long-awaited promulgation of the RCRA regulations. However, because of an explosion and fire the previous week, the EPA, under the advice of the New Jersey Department of Environmental Protection, decided to cancel the news conference because "the approximately 100 reporters expected to attend would need protective clothing to get on or near the site."[92] On 19 May, the day the RCRA Phase I regulations were published in the *Federal Register,* the Love Canal Homeowners Association staged the EPA "hostage-taking" event. Following the May 19th publication, industry and environmental groups collectively filed fifty-two notices of intent-to-sue the EPA.[93] Clearly, hazardous waste had evolved into a national environmental problem.

The resultant regulatory structure of RCRA is based on the presumption that hazardous waste presents the highest public health risk, although experts generally agree that hazardous waste presents only a moderate, localized risk. The result is a byzantine collection of highly proscriptive command-and-control dictates based on a dichotomous classification scheme for hazardous waste occupying some five hundred pages in the *Code of Federal Regulations*.[94] That is, waste is either hazardous or it is not. And if it is defined as hazardous, very strict regulatory requirements apply. This system inherently does not

recognize degrees of hazardousness or risk. Because of this approach, there are substantial current and future policy ramifications for hazardous waste management. Because of the major risk perceived by the public, the government faces major regulatory hurdles and public relations challenges when seeking innovative solutions that could be viewed as loosening the protection that hazardous waste deserves. Illustrative of this is the passage of the Hazardous and Solid Waste Amendments of 1984, which was passed amid a barrage of media, public, and congressional outcry. In this law, a rebuke of President Reagan's attempt to loosen regulatory controls over hazardous waste, Congress dramatically strengthened federal authority and usurped traditional executive-branch discretion by micromanaging the EPA through the creation of numerous deadlines and so-called hammer provisions to further strengthen the management of hazardous waste.

Conclusion

From 1965 until 1978, except for the nerve gas controversy and isolated local cases, the media and the public paid little attention to hazardous waste. Nevertheless, starting in 1970, the federal government began an effort to address hazardous waste even though the media and the public remained uninterested. From 1978 to 1980, hazardous waste rocketed to the top of the national agenda. In a 1982 Louis Harris survey, ninety-five percent of a national sample viewed "disposal of hazardous waste" as a "serious problem."[95] The EPA's studies of 1987 and 1990 found that the public viewed hazardous waste as a major risk. As late as 1989, more than ten years after the discovery of Love Canal, a *Cambridge Report* public poll reported that disposal of hazardous waste was considered both the most serious environmental and personal threat of the ten most significant environmental issues presented.[96] Hazardous waste undeniably was now perceived as a serious national environmental problem warranting federal action.

The conditions that propelled hazardous waste's rise shaped the risk perception of the media and public. This perception, coupled with intense media attention, subsequently fostered scrutiny from Congress, environmental groups, and industry toward the EPA's efforts to implement and administer RCRA. Although multiple external and internal factors affected the EPA's approach to hazardous

waste management, media and public perception of its risk were dominant.

The evolution of hazardous waste as a national environmental problem demonstrates how crucial media and public attention and concern can be for government action. The case of hazardous waste is also illustrative of a problem in American policymaking: the political elites were arguably attempting to develop a reasonable framework for hazardous waste management, but because of the lack of public and media concern, there was insufficient political capital and impetus for action. It was not until Love Canal that the government was pushed into responding to a misunderstood, and thus framed, problem, which resulted in an inappropriate policy response, one that diminished the potential for future policy revision and innovation.

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Notes

1. NBC News, Tuesday, 18 August 1970.

2. J. Clarence Davies III, *The Politics of Pollution* (Indianapolis, 1970).

3. In 1987, an EPA special task force released its report, "Unfinished Business: A Comparative Assessment of Environmental Problems." It found that hazardous waste disposal presented a relatively low risk to public health and the environment. But it also found that the public viewed the risks quite differently and was a major determinant in the EPA's priorities. In 1990, the EPA's Science Advisory Board released a report, "Reducing Risk: Setting Priorities and Strategies for Environmental Protection," which agreed with the previous EPA analysis about the relative risk of hazardous waste disposal and concluded similarly that the public perception of risk was driving EPA activity.

4. See, for example, Alan Mazur, "Controversial Technologies in the Mass Media," in Michael E. Kraft and Norman J. Vig, eds., *Technology and Politics* (Durham, 1988), 140–58.

5. See, for example, Craig E. Colton and Peter N. Skinner, *The Road to Love Canal: Managing Industrial Waste before EPA* (Austin, 1996), and Halina Szejnwald Brown, Brian J Cook, Robert Krueger, and Jo Anne Shatkin, "Reassessing the History of U.S. Hazardous Waste Disposal Policy—Problem Definition, Expert Knowledge, and Agenda-Setting," *Risk* 8 (1997): 247.

6. Colton and Skinner, *The Road to Love Canal*.

7. Based on a search of the Library of Congress catalog and WorldCat, the first document title to contain the term "hazardous waste" was a report published by the Manufacturing Chemist's Association in 1961 ("Recommended Safe Practices and Procedures: Disposal of Hazardous Waste," Safety Guide SG-9). However, this appears to be an anomaly as the next document containing the term "hazardous waste" did not appear again until 1970 ("Selected Problems of Hazardous Waste Management in California: Report of the Hazardous Wastes Working Group of the Governor's Task Force on Solid Waste Management," 2 January 1970). In addition, one reference was found in 1971, two in 1972, and, finally, in the EPA's Report to

Congress in 1973. The infrequent use of the term "hazardous waste" continued until 1978, the year of Love Canal. Searching Vanderbilt University's Television News Archive and the *New York Times* index also revealed no references to hazardous waste during the 1960s and 1970s.

8. President's Science Advisory Committee, Environmental Pollution Panel, "Restoring the Quality of Our Environment" (November 1965), 135.

9. *A Legislative History of the Solid Waste Disposal Act, as Amended,* 92d Cong., 2d sess. (October 1974), 259.

10. Although the public health effects, primarily disease vectors, were well known, intentional and unintentional burning of solid waste was becoming a concern, especially since the federal government's intervention into pollution control focused on air pollution. See National Academy of Sciences, *Waste Management and Control* (Washington, D.C., 1966), "The Clean Air Act Amendments and Solid Waste Disposal Act of 1965 (PL-89-272)," *Health, Education & Welfare Indicators,* U.S. Department of Health, Education, and Welfare, Washington, D.C., November 1965, 10.

11. National Academy of Sciences, *Waste Management and Control.*

12. Ibid., 476.

13. *A Legislative History of the Solid Waste Disposal Act, as Amended,* 471.

14. The Solid Waste Disposal Act, Section 202(a).

15. Ibid., Section 203.

16. Ibid., Section 202(b).

17. Hazel Erskine, "The Polls: Pollution and Its Costs," *The Public Opinion Quarterly* 36, no. 1 (Spring 1972): 120.

18. Stanford University, *Mass Media and the Environment: Volume II, The Environmental Information Explosion: The Press Discovers the Environment* (September 1971), 19.

19. Arvin W. Murch, "Public Concern for Environmental Pollution," *The Public Opinion Quarterly* 35, no. 1 (Spring 1971): 100.

20. Ibid., 120–35.

21. The National Environmental Policy Act of 1969 (P. L. 91-190) was signed into law by President Nixon on 1 January 1970. President Nixon's State of the Union Message was delivered on 22 January. President Nixon created the U.S. Environmental Protection Agency and National Oceanic and Atmospheric Administration on 9 July 1970, under Organizational Plan Number 3. The Council on Environmental Quality was created by the National Environmental Policy Act of 1969.

22. "Ocean Disposal of Unserviceable Chemical Munitions," Hearings Before the Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, 91st Cong., 3, 4, 6, 7 August 1970, 2–3.

23. Ibid.

24. Richard D. Lyons, "Nerve Gas Move Is Barred Till Judge Hears All Views," *New York Times,* 14 August 1970, 1.

25. Richard D. Lyons, "Nerve Gas Trains Will Cross 7 States," *New York Times,* 31 July 1970, 41.

26. Interestingly, roughly the same amount of nerve gas in unserviceable rockets was dumped off the coast of New Jersey in 1967 and 1968, but it was not reported. According to Edward W. Lawless, in *Technology and Social Shock* (New Brunswick, 1977), the Army's nerve gas disposal program was secret, but a Pentagon source leaked information regarding the activity in May 1969 to Representative Richard McCarthy (D-N.Y.). Following this leak and a series of events, the mass media focused on the story in the summer of 1970. See also "Ocean Disposal of Unserviceable Chemical Munitions," 10. As noted by Brigadier General W. W.

Stone Jr., in reference to operation CHASE, ocean dumping was "the standard means for a number of years for the disposition of ammunition of all types, including chemical ammunition." "Dumping of Nerve Gas Rockets in the Ocean," Hearing Before the Subcommittee on Commerce, U.S. Senate, 91st Cong., 5 August 1970, 90.

27. The greatest public outcry and concern resulted from the transportation of the nerve gas through the many communities on the way to the Sunny Point Military Terminal.

28. Some of the stories that precipitated the disposal event focused on the transportation of nerve gas from Okinawa to the United States for disposal.

29. Serious consideration was given to destroying the nerve gas by underground nuclear detonation. However, preparation of the detonation would take too long given the structural condition of the munitions. See "Ocean Disposal of Unserviceable Chemical Munitions," 10–17, and "Dumping of Nerve Gas Rockets in the Ocean."

30. John W. Kingdon, *Agendas, Alternatives, and Public Policies*, 2d ed. (New York, 1995), 98.

31. *Resource Recovery Act of 1970: Report of the Committee on Public Works, United States Senate, to accompany S. 2005, Together with an Individual View*, 91st Cong., 2d sess., 23 July 1970, 16–17.

32. P.L. 91-512.

33. Certainly the variety of terms used to describe waste added to the inability to clearly construct the meaning of hazardous waste. Throughout the twentieth century, the terms "trade wastes," "industrial wastes," "chemical wastes," "refuse," "industrial solid waste," "toxic industrial waste," "hazardous materials," "dangerous materials," and "hazardous substances" were all interchangeably used to refer to wastes of special concern.

34. Council on Environmental Quality, "Ocean Dumping: A National Policy," October 1970.

35. Ibid., v.

36. *Marine Protection, Research, and Sanctuaries Act of 1971: Report to the Committee on Merchant Marine and Fisheries, to accompany H.R. 9727*, 92d Cong., 1st sess., 17 July 1971, 11.

37. Anthony Downs, "Up and Down with Ecology: The 'Issue Attention Cycle,'" *Public Interest* 28 (1972): 38–50.

38. Riley E. Dunlap, 1995. "Public Opinion and Environmental Policy," in James P. Lester, ed., *Environmental Politics and Policy: Theories and Evidence*, 2d ed. (Durham, 1995).

39. This legislation was intended to be Title III to the Federal Water Pollution Control Act Amendments of 1972.

40. Council on Environmental Quality, *The President's 1972 Environmental Program* (March 1972), 18.

41. Samuel S. Epstein, Lester O. Brown, and Carl Pope, *Hazardous Waste in America* (San Francisco, 1982), 186–87.

42. Ibid. 187.

43. Ibid.

44. E. W. Kenworthy, "Bills by Nixon and Muskie on Waste Differ Sharply," *New York Times*, 5 February 1973, 32.

45. "EPA to Shift Program Emphasis to Hazardous Waste Regulation," *Environmental Reporter*, Bureau of National Affairs (March 1973), 1310.

46. *A Legislative History of the Solid Waste Disposal Act, as Amended*, 47.

47. Ibid., 49.

48. William L. Kovacs and John F. Klucsik, "The New Federal Role in Solid Waste Management: The Resource Conservation and Recovery Act of 1976," *Columbia Journal of Environmental Law* 3 (1977): 216.

49. U.S. EPA, *Disposal of Hazardous Wastes: Report to Congress by the Environmental Protection Agency Pursuant to Section 212 of the Solid Waste Disposal Act, as Amended* (June 1974), ix.
50. Ibid., 15.
51. Ibid.
52. *Disposal of Hazardous Wastes: Report to Congress,* 8.
53. H.R. Report No. 94-1491, 94th Cong., 2d sess. (9 September 1976), 12.
54. Epstein, Brown, and Pope, *Hazardous Waste in America,* 186–87.
55. Ibid., 189.
56. Ibid.
57. "The New Federal Role in Solid Waste Management: The Resource Conservation and Recovery Act of 1976," 217.
58. *Federal Register,* 40 *FR* 42993, 17 September 1975.
59. The speakers and their positions regarding national hazardous waste legislation were obtained from *1975 Public Meetings on Hazardous Waste Management: Proceedings,* U.S. Environmental Protection Agency, 1976. See also Mark K. Landy, Marc J. Roberts, and Stephen R. Thomas, *The Environmental Protection Agency: Asking the Wrong Questions* (New York, 1990), 91, regarding industry's lobbying efforts for a national program.
60. Ibid.
61. Epstein, Brown, and Pope, *Hazardous Waste in America,* 191.
62. Ibid.
63. H.R. Report No. 94-1491, 94th Cong., 2d sess. (9 September 1976), 3.
64. Ibid., 4.
65. The bill H.R. 14496 was approved and combined with another solid waste bill, H.R. 14965, which focused on research, development, and demonstration projects for resource recovery.
66. Landy et al., *The Environmental Protection Agency: Asking the Wrong Questions,* 92.
67. Kovacs and Klucsik, "The New Federal Role in Solid Waste Management," 219–20.
68. Ibid., 220.
69. "Also on Capitol Hill," *Washington Post*, 1 October 1976, A3.
70. "Toxic Substances Bill Becomes Law," *EDF Newsletter* 7, no. 5 (September 1976).
71. The Sierra Club publishes *The Sierra Club Bulletin* and the Natural Resources Defense Council publishes *Amicus*.
72. Blake Early, personal communication, 25 November 1998, email in response to questions regarding environmental lobbying at RCRA.
73. Ibid.
74. TSCA, signed into law on 11 October 1976, provided EPA with the authority to control a chemical substance presenting an unreasonable risk at any point in its life cycle, including its manufacture, importation, processing, disposal, distribution, use, and *disposal*. Thus, theoretically, TSCA could control toxic substances before they became toxic (hazardous) wastes.
75. Landy et al., *The Environmental Protection Agency: Asking the Wrong Questions,* 102.
76. Ibid.
77. The Love Canal, an abandoned clay-lined ditch, was the remnants of an attempt to build a canal in Niagara Falls, New York. The old canal was used as a hazardous waste disposal site by Hooker Chemical Company from 1942 to 1952. In 1953, the company transferred the parcel of land containing the canal to the city's Board of Education for construction of a school and playground. Between 1953 and 1960, a school, playground, streets, sewer lines, and utility lines were constructed

crossing and parallel to the canal. This infrastructure supported the construction of single-family homes throughout the area, some with yards abutting the canal. The canal's structural integrity, caused by years of construction, coupled with heavier-than-normal precipitation in 1976–77, weakened and its contents overflowed and seeped into adjacent basements and rose to the surface.
In response to citizen complaints, the EPA and the New York Department of Environmental Conservation began sampling affected homes in early 1978. Results from these and subsequent sampling events confirmed the presence of toxic and carcinogenic substances (e.g., dioxin and benzene) in homes abutting the canal. The EPA and the New York State Department of Health began to express concerns publicly for the health of the homeowners. See Alan Mazur, *A Hazardous Inquiry: The Rashomon Effect at Love Canal* (Cambridge, Mass., 1998).

78. Ibid., 14.

79. Mazur, "Controversial Technologies in the Mass Media," 143.

80. Landy et al., *The Environmental Protection Agency: Asking the Wrong Questions,* 103.

81. Mazur, *A Hazardous Inquiry,* 106.

82. Landy et al., *The Environmental Protection Agency: Asking the Wrong Questions,* 135.

83. Steffen W. Phlen, "RCRA: A Personal Perspective," *The Environmental Professional* 3 (1981): 19.

84. Ibid.

85. Ibid.

86. Mazur, *A Hazardous Inquiry,* 81.

87. Mazur, "Controversial Technologies in the Mass Media," 145.

88. Mazur, *A Hazardous Inquiry,* 137.

89. Ibid., 146.

90. Landy et al., *The Environmental Protection Agency: Asking the Wrong Questions,* 138.

91. Ibid., 155.

92. *New York Times,* 30 April 1980, B6.

93. Landy et al., *The Environmental Protection Agency: Asking the Wrong Questions,* 120.

94. This of course does not include the hundreds of thousands of additional pages required to (a) explain the regulations in preambles to the regulations in the *Federal Register,* (b) interpret the regulations through policy memoranda and directives, and (c) explain further in guidance manuals the regulatory requirements and additional interpretations.

95. Riley E. Dunlap, "Public Opinion: Behind the Transformation," EPA *Journal* (July–August 1985): 17.

96. Riley E. Dunlap, "Trends in Public Opinion Toward Environmental Issues: 1965–1990," in *American Environmentalism: The U.S. Environmental Movement, 1970–1990* (New York, 1992), 111.